The London/Prague Seminar Series on Financial Markets

Modelling and Testing for Jumps in Financial Markets

30 March 2012

Venue: Cass Business School, 106 Bunhill Row, London, EC17 8TZ
(Room 6032)

Organiser: Giovanni Urga

PROGRAMME

FRIDAY, 30 MARCH 2012

Session 1

Chair: Giovanni Urga (Cass, London, UK)

9:00-11:00

Ana-Maria Dumitru (Surrey University, UK)
Averaging Tests for Jumps

Abstract.
We propose a new procedure to detect jumps in prices in the presence of microstructure noise that relies on averaging results from various tests for jumps existing in the literature applied at different sampling frequencies. This new approach overcomes previous limitations in jump detection in the presence of microstructure noise, that lead to sub-sampling and low power properties. We use a modified version of Fisher's method to combine p-values for the Barndorff-Nielsen and Shephard (2006) test applied at different sampling frequencies. We propose a double bootstrap procedure to obtain an empirical distribution for Fisher's test statistic.

Jan Hanousek, Evžen Kočenda, Jan Novotný (CERGE-EI Prague, CZ and Manchester University, UK), -- *Identification of Price Jumps (Theory and Simulations)*

Abstract.
We performed an extensive simulation study to compare the relative performance of many price-jump indicators with respect to false positive and false negative probabilities. We simulated twenty different time series specifications with different intraday noise volatility patterns and price-jump specifications. The double McNemar non-parametric test (Psychometrika 12 (1947), 153–157) has been applied on constructed artificial time series to compare fourteen different price-jump indicators that are widely used in the literature. The results suggest large differences in terms of performance among the indicators, but we were able to identify the best-performing indicators. In the case of false positive probability, the best-performing price-jump indicator is based on thresholding with respect to centiles. In the case of false negative probability, the best indicator is based on bipower variation.

Vincenzo Maini (CEA, Cass Business School, UK) and Giovanni Urga (CEA, Cass Business School, UK)
The Liquidity to Price Transmission Mechanism: A Combination of Nonparametric Tests for Jumps
Abstract.
In this paper, we propose a new approach to the determination of co-jumps using a combination of the most common nonparametric tests in the literature and study the transmission mechanism between liquidity and asset price dynamics. The methodology used allows us to assess the co-existance of endogenous and exogenous jumps and to detect spurious co-jumps in the series. Using data from EUR/USD FX, sampled at high frequency, we find evidence of contemporaneous and lagged co-jumps between available liquidity and underlying price.

11.00 -11.30 BREAK

Session 2

Chair: Jan Hanousek (CERGE-EI, Prague, CZ)

11:30-13:30

Jan Hanousek, Evžen Kočenda (CERGE-EI, Prague) Jan Novotný
Price Jumps: Performance Evaluation and Stock Markets Empirics
Abstract.
We perform a non-parametric evaluation of performance of a broad class of price-jump indicators. We simulate twenty different time-series specifications with different intraday noise volatility patterns and price-jump specifications. With the McNemar test we compare fourteen different price-jump indicators with respect to false positive and false negative probabilities. The results provide two indicators that dominate others and further suggest large differences among the indicators in terms of their accuracy to detect price jumps. We complement our simulation analysis by empirical application on nine stock market indices from both mature and emerging markets. The application supports performance differences between the price jump indicators and their tendency to cluster according to the number of price jumps per month they detect while the actual overlap between the detected price jumps is very low. Stability in the detected numbers of price jumps over time suggests that the recent financial crisis did not change the overall jumpiness of the stock markets.

Massimiliano Caporin, Eduardo Rossi (Pavia University, Italy) and Paolo Santucci de Magistris.
Volatility Jumps and their Economic Determinants
Abstract.
The volatility of financial returns is characterized by rapid and large increments. We propose an extension of Heterogeneous Autoregressive model for estimating the presence of jumps in volatility, using the realized-range measure as a volatility proxy. By focusing on a set of 36 NYSE stocks, we show that there is a positive probability of jumps in volatility. We analyze the dependence between a common factor in the volatility jumps on a set of financial covariates (VIX, S&P500 volume, credit-default swap, and federal fund rates). We observe that credit-default swap on US banks

captures large part of the expected jump moves, verifying the common interpretation that large and sudden increases in volatility in stock markets over some days in the recent financial crisis have been caused by credit deterioration of US bank sector. Finally, we extend the model incorporating the credit-default swap in the dynamics of the jump size and intensity. The estimates confirm the significant contribution of the credit-default swap to the dynamics of the volatility jump size.

Jan Hanousek (CERGE-EI Prague, CZ) and Jan Novotný
Price Jumps in Visegrad-Country Stock Markets: An Empirical Analysis
Abstract.
We employ high frequency data to study extreme price changes (i.e., price jumps) in the Prague, Warsaw, Budapest, and Frankfurt stock market indexes from June 2003 to December 2010. We use the price jump index and normalized returns to analyze the distribution of extreme returns. The comparison of jump distributions across different frequencies, periods, up and down moves, and markets suggests a possible relationship with different market regulation and micro-structure. We also show that the recent financial crisis resulted in an overall increase in volatility; however, this was not translated into an increase in the absolute number of jumps.

13:30 END OF THE SEMINAR